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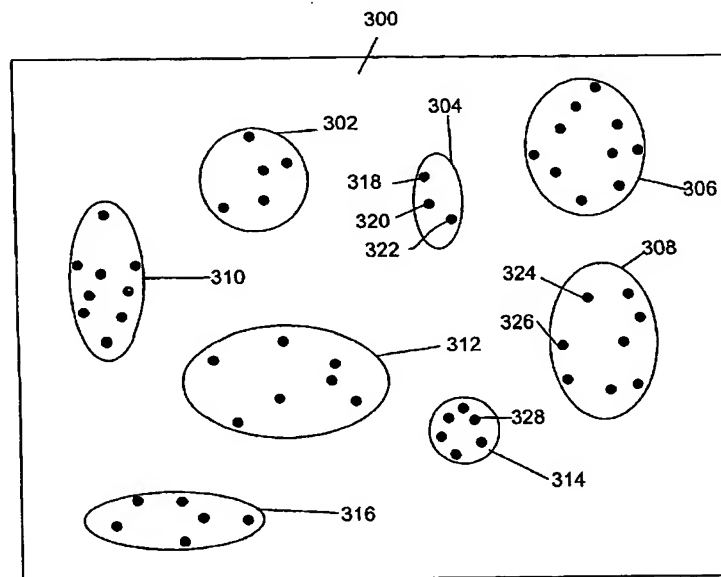
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[Continued on next page]

(54) Title: UNIT FOR AND METHOD OF DETECTION A CONTENT PROPERTY IN A SEQUENCE OF VIDEO IMAGES



(57) Abstract: A method of detection of a content property in a data stream on basis of low-level features is proposed. The method comprises: determining (202) a behavior feature (e.g. 320) from a sequence of the low-level features; determining (204) to which one of the predetermined clusters (304) of behavior features (318-328) within a behavior feature space (300) the determined behavior feature (320) belongs; determining a confidence level of the content property presence on basis of the determined cluster (304) of behavior features and the determined behavior feature; and detecting the content property on basis of the confidence level of the content property presence.



PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

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B. FIELDS SEARCHED

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	LI D ET AL: "Classification of general audio data for content-based retrieval" PATTERN RECOGNITION LETTERS, NORTH-HOLLAND PUBL. AMSTERDAM, NL, vol. 22, no. 5, April 2001 (2001-04), pages 533-544, XP004233004 ISSN: 0167-8655 page 535 -page 539 figures 2-4 --- -/--	1-13,17

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>ZHANG T ET AL: "Audio content analysis for online audiovisual data segmentation and classification" IEEE TRANSACTIONS ON SPEECH AND AUDIO PROCESSING, IEEE INC. NEW YORK, US, vol. 9, no. 4, May 2001 (2001-05), pages 441-457, XP001164214 ISSN: 1063-6676 page 443, left-hand column, line 21 -page 444, right-hand column, line 40 page 450, left-hand column, line 9 -page 451, right-hand column, line 7 figure 1</p>	1-13,17
X	<p>PIIRAINEN T ET AL: "Layered self-organizing maps based video content classification" PROCEEDINGS OF 12TH SCANDINAVIAN CONFERENCE ON IMAGE ANALYSIS, PROCEEDINGS OF SCIA 2001 SCANDINAVIAN CONFERENCE ON IMAGE ANALYSIS, BERGEN, NORWAY, 11-14 JUNE 2001, pages 595-599, XP008030923 2001, Stavanger, Norway, Norwegian Soc. Image Process. & Pattern Recognition, Norway ISBN: 82-995940-0-6 page 595, right-hand column, line 18 -page 597, right-hand column figures 2,6</p>	1-8, 13-17
X	<p>EP 0 938 054 A (SIEMENS CORP RES INC) 25 August 1999 (1999-08-25) paragraphs '0036!, '0047!-'0049!</p>	1-4, 13-17

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EP

6278446 B1
0938054 A2

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